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RAPID TRANSIT STUDY

ROUTE CHOICES: SUMMARY OF FINDINGS

ABOUT THE MAJOR CHARACTERISTICS OF THE FOUR POSSIBLE RAPID TRANSIT ROUTES

JUNE 1981

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INTRODUCTION

THE RAPID TRANSIT STUDY

In August, 1980, the Regional Municipality of Hamilton-Wentworth entered into a contract with Metro Canada Limited as prime consultant to undertake the study of a proposed rapid transit service linking the Downtown core with the Central Mountain.

Metro Canada Limited is a wholly-owned subsidiary of the Urban Transportation Development Corporation, which was created in 1973 by the Government of Ontario to act as an industrial catalyst in the design and development of a variety of different new technologies for public transportation.

Metro Canada Limited has, in turn, contracted with a number of sub-consultants, with special expertise, to investigate specific aspects of the overall study.

The purpose of this report is to summarize the findings of the prime consultant and sub-consultants about those major route characteristics which are important in selecting a preferred route for a rapid transit service. (See the Appendix for a list of sub-consultants and their responsibilities).

This report compares the major characteristics of each of the four rapid transit routes adopted by Regional Council in March, 1981, for further examination. These major characteristics are cost, ridership, station location, travel time, natural environment, surface transportation, property requirements, construction impacts, visual perspectives, development strategies and future extensions.

In addition, this report discusses the context for rapid transit, its relationship to community development patterns and six general issues which concern all rapid transit routes. These issues involve:

- o Property -- residential property values, expropriation and compensation;
- o Economics -- tax impact, subsidies, impact on business and job creation;
- o Passenger Access -- station design, bus connections, parking, kiss 'n' ride, fares and collection and service levels;

- o Personal Security -- vandalism, emergency response, passenger security and fire protection;

- o Street Fit -- appearance, landscaping, visual intrusion and shadows; and,

- o Natural and Human Environment - noise and vibration, shadows, geology, climate, air quality, archaeology, historic and architectural preservation, privacy and quality of life.

The intent of the study team in preparing the report is to present information describing the characteristics of the four routes under study. The report does not include any recommendations.

The Regional Council of Hamilton-Wentworth will be considering this information for several weeks and listening to public opinion before determining a preferred route. Council has scheduled a special meeting on Wednesday, June 24 to give all interested persons an opportunity to present briefs about this study and the proposed rapid transit service.

The study team will be evaluating the findings in this report and public comments before formulating a recommendation of a preferred route.

Once Regional Council selects a preferred route, it will become the subject of the final phase of this study.

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THE CONTEXT FOR RAPID TRANSIT

THE FUTURE DEVELOPMENT OF HAMILTON-WENTWORTH

The ability to improve services, to strengthen the tax base and to provide new and better job opportunities depends upon the Region's ability to compete for industrial and commercial development and to attract private sector investment capital.

A planning target for economic growth and employment opportunities has been set for the Region based on its fair share of the estimated future growth and economic development in the Province over the next 20 years. These targets have been defined in the Regional Official Plan.

The Regional development strategy is how the Region intends to achieve these targets. The strategy is the set of policies, programs and projects which the Region and its constituent municipalities will implement over time, in order to achieve the target levels of jobs, population, and services.

The following paragraphs summarize this strategy as it relates to the rapid transit project under study.

REGIONAL DEVELOPMENT STRATEGY AND RAPID TRANSIT

Industrial Jobs

The Region is investing in the roads and sewer services which are necessary to attract industrial investment.

Development of services to 4,000 acres of new industrial parks is provided for in the 1981-85 public works program.

Commercial Sector Jobs

80% of future job growth targeted in the Region is in the commercial and institutional services sector. Approximately 37,000 of these jobs (35% of the total) have been designated for location in the Downtown Central Business District to provide a central focus for business activity. This will support a higher quality public transportation service.

To date, only a small fraction of the commercial space permitted in the Central Business District has been constructed, despite the municipal commitment in 1970 to an extensive Civic Square Redevelopment Project.

The new Central Area Plan emphasizes a new image for the downtown. The new Regional Business Promotion Committee, the activity regarding the proposed arena, and a rapid transit system are the principal current efforts to stimulate commercial interest in the downtown.

Any new transit strategy will be developed in the context of the Central Area Plan.

Residential Services

The Official Plan policies will minimize the future cost of servicing new housing by giving priority to those areas which have ready access to existing water and sewer services. These areas will be in the South Mountain of Hamilton, in Ancaster, and in Stoney Creek. If job and population development proceeds according to forecasts, this will result in greatly increased transportation needs from these areas to the Central Business District.

Transportation Services

Public transit has been given a high priority in the planning of new transportation facilities in the Official Plan. This emphasis is necessary in order to reduce the use of automobiles in the downtown area and to provide improved transit services throughout the Region.

A series of studies since 1969 have proposed a rapid transit link between downtown and the Mountain suburbs. Since no more major roads will be constructed across the central escarpment to serve increased travel demand from the Mountain to the downtown area, the Official Plan gives high priority to the planning of a medium-capacity, rapid transit service connecting downtown Hamilton with the Central Mountain.

The Transportation Capital Facilities Plan gives priority to sewer and road projects which will make land available for industrial and residential development. It also gives priority to improving overall travel speeds in the major transportation corridors. This plan recognizes that rapid transit in the Central Mountain corridor will be a priority project by the mid 1990's.

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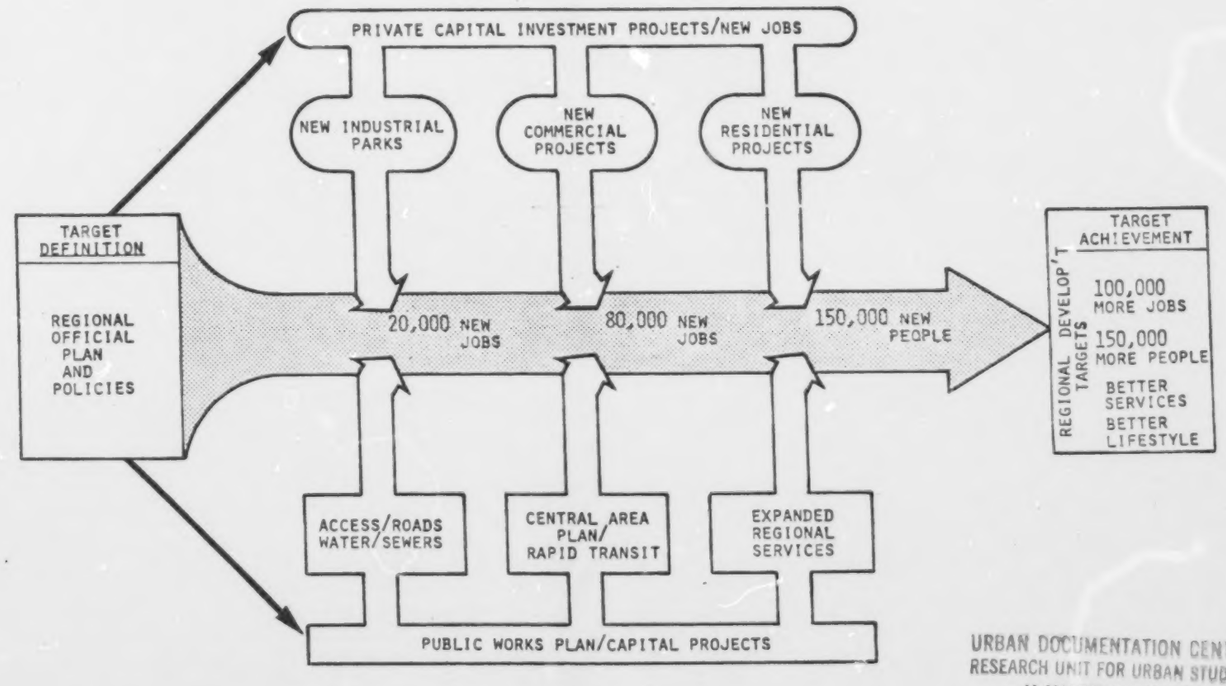

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REGIONAL DEVELOPMENT STRATEGY

THE RATIONALE FOR RAPID TRANSIT

This study's interim report on the rationale for a rapid transit system (November, 1980) reported that there were more compelling reasons than the reduction of traffic congestion as the basis for early implementation of a rapid transit service. These reasons are:

- Early implementation would help attract major commercial projects by reducing the risk to private capital investors of decisions about future downtown transportation service investments;

- Early implementation would provide a strong transit-oriented urban development option (Central Business District focus and higher-density residential development) at the same time as higher growth rates are expected, and thus would help achieve many of the Region's development goals;

- Early implementation would protect the Region's existing public capital investments for future industrial and commercial development. This would help provide the essential public service investment needed to support economic development in the Central Area and Mountain Corridor;

- Early implementation would offer better transit services sooner for people who want or do not have an alternative to the automobile;

- Early implementation would provide better transit services throughout the Region such as improved connections to GO transit at the future Inter-Regional Bus Terminal.

- Early implementation - as a Rapid Transit Demonstration Project for Canadian transit technology - before mature transit ridership demands are realized means more advantageous capital and operating cost-sharing agreements may be attained than could otherwise be expected.

- Later implementation of a rapid transit service will have substantially few benefits, primarily because the location and densities of developments and redevelopments will have been influenced by existing road and transit patterns. The risk of failure to achieve an acceptable economic return from the public investment in a delayed rapid transit project will be substantial.

If the major justification of the rapid transit proposal were to be the need to reduce traffic congestion, then a rapid transit service on its own right-of-way would not be needed before 1990 or later.

This line of reasoning would see rapid transit built only after the capacity of the Mountain access roads had been exceeded, resulting in stop-and-go traffic. This point of view is based on the current, relatively low rates of growth of jobs and population.

This transportation policy could be counter-productive to efforts to attract commercial projects and economic growth. Early implementation of a rapid transit service can serve productive purposes, as noted above.

BACKGROUND TO TRANSIT STUDIES

In the 1960's, traffic congestion became so severe on the Central Mountain access roads that the City of Hamilton decided to construct the Claremont Access Road. The opening of the Claremont in the early 1970's immediately relieved traffic congestion on the Central Mountain roads. However, as population increases, vehicle traffic will increase further and congestion is expected to again become severe, reaching a stop-and-go situation in the early 1990's.

A number of studies by the City of Hamilton and the Regional Municipality of Hamilton-Wentworth have led to the selection of the Central Mountain Corridor as the first priority corridor requiring rapid transit service. The following list of background studies provides the history behind the decision by the Region to conduct a Pre-Implementation Study of the Intermediate Capacity Transit System (ICTS) technology as part of their overall planning strategy.

The Mountain Corridor was identified as the first link of a rapid transit system that would also serve the needs of the industrial core and future east-west transportation needs.

TRANSIT STUDIES

1969 - Hamilton Transit Planning Committee recognized future need for all-weather rapid transit link between Mountain and Downtown.

1970 - Hamilton Planning Department established principles and objectives for a rapid transit development strategy.

1970 - Hamilton Transit Commission confirmed the physical feasibility to construct all forms of rapid transit in Hamilton.

1973 - City of Hamilton reported on transportation strategies, including the potential to link downtown to the Mountain with an intermediate capacity transit system.

1976 - Transportation Development Agency (Canada) reported that the Hamilton Mountain Corridor has the highest potential demand for rapid transit in Hamilton.

1976 - City of Hamilton, Transit Commission and Region identified the Mountain to Downtown as the priority transit corridor.

1980 - Region's Official Plan stated high priority for rapid transit in the Mountain Corridor.

1980 - City's Official Plan (draft) supported transit objectives of the Region.

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SUMMARY OF FINDINGS

FOUR POSSIBLE RAPID TRANSIT ROUTES

The rapid transit study includes a series of key milestone points at which findings, recommendations and information are to be referred from the Study Team to Regional Council for consideration. Council has dealt with, among other things, information concerning the identification of 12 feasible rapid transit routes, and the reduction from 12 to four in the number of routes under study.

The most important decision to arise from this study once it is completed will be in the hands of Regional Council namely whether to proceed with the proposed rapid transit service. The single most important decision to be taken during the course of this study is the selection of a preferred rapid transit route. This section of the report summarizes the information that has been developed to describe the characteristics of the four routes under consideration.

The selection of a preferred route will be made on the basis of key differences among the four routes. For this reason, this report and the analyses summarized in it gives greatest attention to those characteristics -- economic, social, transportation, environmental and engineering -- that are different among routes. This report defines the differences among routes in an attempt to identify the types of choices that will be required in order for the study team to prepare a recommendation and for Council to make a decision on a preferred rapid transit route.

MAJOR FACTORS ANALYZED

The major factors that have been analyzed for the four possible routes and are summarized in this findings report are:

COST
RIDERSHIP
POTENTIAL STATION SITES
TRAVEL TIME
SURFACE TRANSPORTATION
PROPERTY REQUIREMENTS
CONSTRUCTION
VISUAL PERSPECTIVE
DEVELOPMENT POTENTIAL
NATURAL ENVIRONMENT
EXPANSION

SIGNIFICANT DIFFERENCES AMONG ROUTES

Analysis of the differences among the four possible routes divides naturally into three parts -- the downtown core, the Escarpment crossing and the Mountain.

All four routes take the same one-way loop (TH&B - City Hall parking lot - MacNab - King - James - King William - Catharine) in the downtown core. As a result, no differences arise among the four routes in terms of the Central Business District.

The four routes approach the Escarpment crossing along four different paths: W on Hughson/James; X on John/St. Josephs; Y on TH&B/Claremont; and Z on King William/ Claremont. These four different paths produce distinct differences among routes below and on the Escarpment.

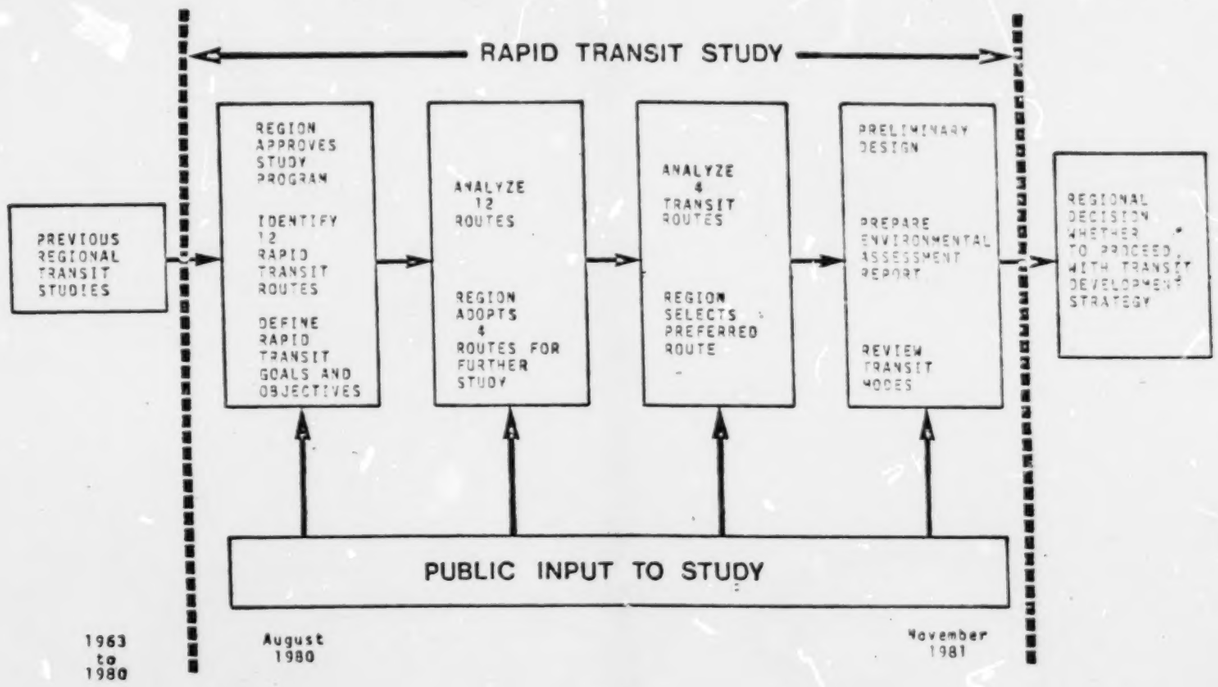
Route W or X have more serious social and environmental impacts than Route Y or Z in this sensitive area. Route Z, however, while reducing impacts on residents and the environment below the Escarpment, increases the travel time for Mountain residents and costs more. Route Y also reduces the impact on both residents and the environment below the Escarpment but may cost somewhat more.

On the Mountain, two primary routes have been studied: Upper James for route W and Upper Wellington for routes X, Y and Z. The essential difference on the Mountain is that the Upper Wellington routes provide superior transit service but create more serious social impacts. Route W on Upper James reduces the social impacts on the Mountain significantly, but also reduces the level of transit service available (i.e. fewer riders).

The other factors shown on the list opposite, but not mentioned above, do not exhibit major differences among routes and, therefore, are not likely to play a major role in the selection of a preferred route. When the Escarpment crossing and Mountain sections of the routes are combined, some of the sectional differences balance each other out. As a result, the primary choice appears to be between social impact and transit service.

Routes X, Y and Z on Upper Wellington offer better transit service at the cost of significant social impact on the Mountain, while route W substantially reduces the social impact on the Mountain but, at the same time, provides less transit service and has a lower negative impact below the Escarpment.

STUDY PROCESS


RAPID TRANSIT STUDY
PREVIOUS REGIONAL TRANSIT STUDIES
REGION APPROVES STUDY PROGRAM
IDENTIFY 12 RAPID TRANSIT ROUTES
DEFINE RAPID TRANSIT GOALS AND OBJECTIVES
ANALYZE 12 ROUTES
REGION ADOPTS 4 ROUTES FOR FURTHER STUDY
ANALYZE 4 TRANSIT ROUTES
REGION SELECTS PREFERRED ROUTE
PRELIMINARY DESIGN
PREPARE ENVIRONMENTAL ASSESSMENT REPORT
REVIEW TRANSIT MODES
REGIONAL DECISION WHETHER TO PROCEED WITH TRANSIT DEVELOPMENT STRATEGY
PUBLIC INPUT TO STUDY
1963 to 1980
August 1980
November 1981

In August, 1980, the Regional Municipality of Hamilton-Wentworth received funding from the Ontario Ministry of Transportation and Communications to carry out a study of the application of an Intermediate Capacity Transit System (ICTS) in the Hamilton Central Mountain Corridor. This corridor was selected by the Region as its priority corridor for Rapid Transit after a decade of study. Metro Canada Limited was engaged by the Region as the prime consultant for the study.

The first step in the study was to identify approximately 12 feasible rapid transit routes. These were made up of approximately 50 individual segments. Each route was developed in response to Regional policies and development and transportation patterns. They were then analyzed in order to determine the best four of the 12 for detailed analysis.

At each stage of the study, a series of Open Houses has been held for the public. The purpose of these meetings was to ensure public participation in the planning process. Public Open Houses will continue throughout all phases of the study.

After a detailed analysis of the four alignments, one alignment will be recommended to Regional Council in the summer of 1981. Once Council selects a preferred route, a final report, including a functional plan and environmental assessment, will be prepared. This will complete this study.

After the conclusion of the study, Council will decide whether to proceed with implementating a rapid transit service.

PUBLIC PARTICIPATION

The function of the public participation program is to provide and receive information to and from the general public. This program includes several elements in order to reach as many people as possible.

Activities of this program include Open Houses, presentations to social, business and community groups, interested institutions and schools, public notices in local newspapers and on radio stations, and flyers distributed to residents and businesses in the study corridor and adjacent areas, schools, and libraries.

Another major component of the program is the Community Advisory Committee on Rapid Transit (C.A.C.R.T.). The mandate of this committee is to inform Metro Canada Limited of the community concerns and desires in respect to the rapid transit study.

OPEN HOUSE RESULTS

In October, the rapid transit project was introduced to the public. The primary goal was to explain the project and its various phases. Of the 40 people who filled out an exit form at the Open House, 68% supported the project, 28% were undecided, and 5% were opposed.

In January, the Open House centred on possible routes and factors to be used in the evaluation of alignment segments. The 314 persons who either sent a mail-back coupon or filled out an exit form at the Open House ranked the factors in this order of importance.

1) quality of service
2) natural environment
3) traffic movement

The public was asked to express their level of support. From the same group of citizens, 69% supported the project, 14% were undecided, and 16% opposed it.

At the March Open Houses the study team was soliciting initial public preferences for routes W, X, Y, and Z and their level of support for the study. The 639 people who responded indicated the following preference:

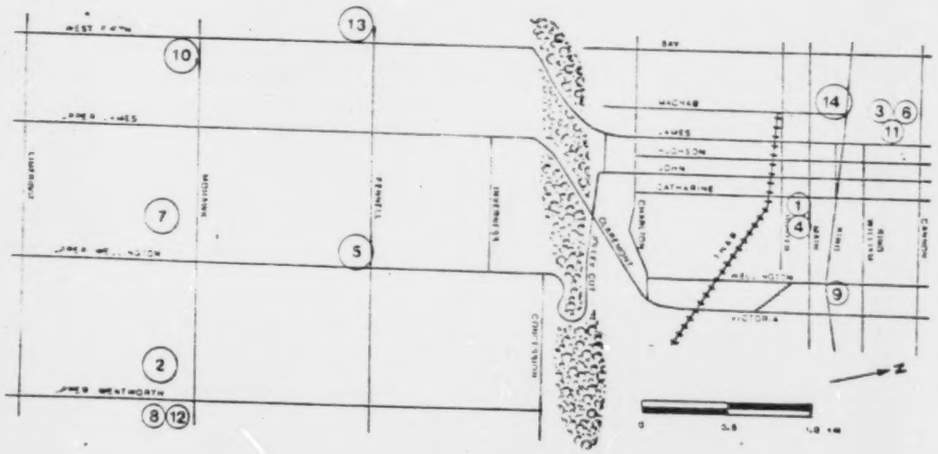
alignment W	- 32%
X	- 9%
Y	- 20%
Z	- 17%
spoiled or no replies	22%

Level of support: 57% supported, 13% undecided and 26% opposed.

In May the Open Houses were designed to provide interim information on the four routes, and included scale models of the system in Mountain and Downtown settings. At this stage, the public was asked to identify the questions they wished more information on. Over 415 citizens responded by completing an exit form or by sending in a coupon. Need ranked first, followed by cost and effect on properties.

OPEN HOUSE LOCATIONS

The numbers in circles on this map identify the locations of Open Houses and correspond to the numbers on the table at the right of this page.



	DATE	LOCATION	ATTENDANCE
1.	Oct. 30 1980	Hamilton-Wentworth Rapid Transit Office	115
2.	Jan. 26 1981	Crestwood Vocational School	133
3.	Jan. 27 1981	New Hamilton Public Library	288
4.	Jan. 28 1981	Hamilton-Wentworth Rapid Transit Office	97
5.	Mar. 9 1981	Transfiguration Lutheran Church	239
6.	Mar. 10 1981	New Hamilton Public Library	358
7.	Mar. 11 1981	St. Michael's Separate School	193
8.	May 26 1981	Ukrainian Catholic Church of the Resurrection	195
9.	May 27 1981	First Place	120
10.	May 28 1981	Immanuel Christian Reformed Church	320
11.	May 29 1981	New Hamilton Public Library	324
12.	Jun. 22 1981	Ukrainian Catholic Church of the Resurrection	
13.	Jun. 23 1981	Mohawk College	
14.	Jun. 24 1981	Hamilton Convention Centre	

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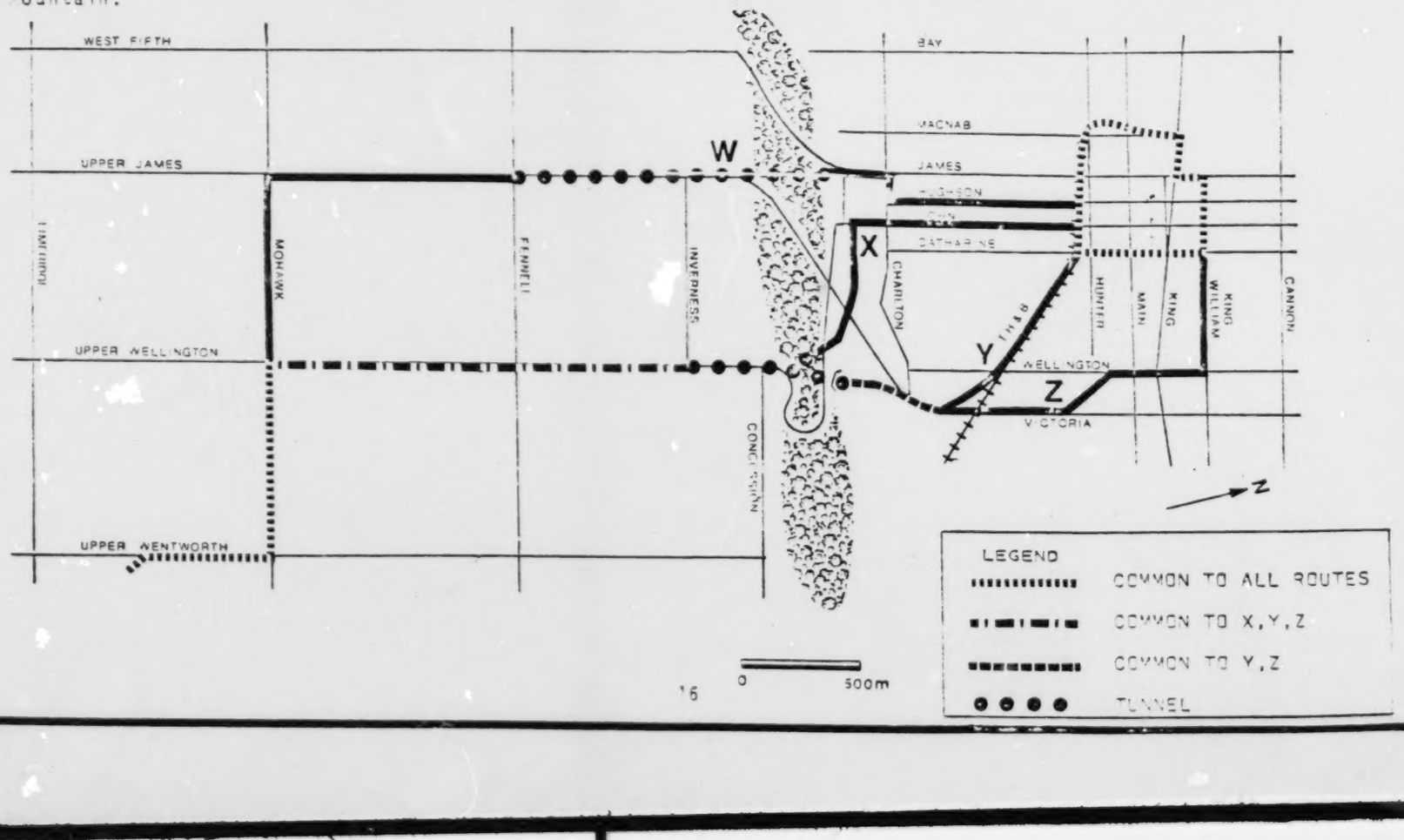
ROUTE DESCRIPTIONS

Four rapid transit routes have been under study for three months. They share a common downtown loop. They cross the escarpment on four different alignment routes, and use two separate alignments on the Mountain.



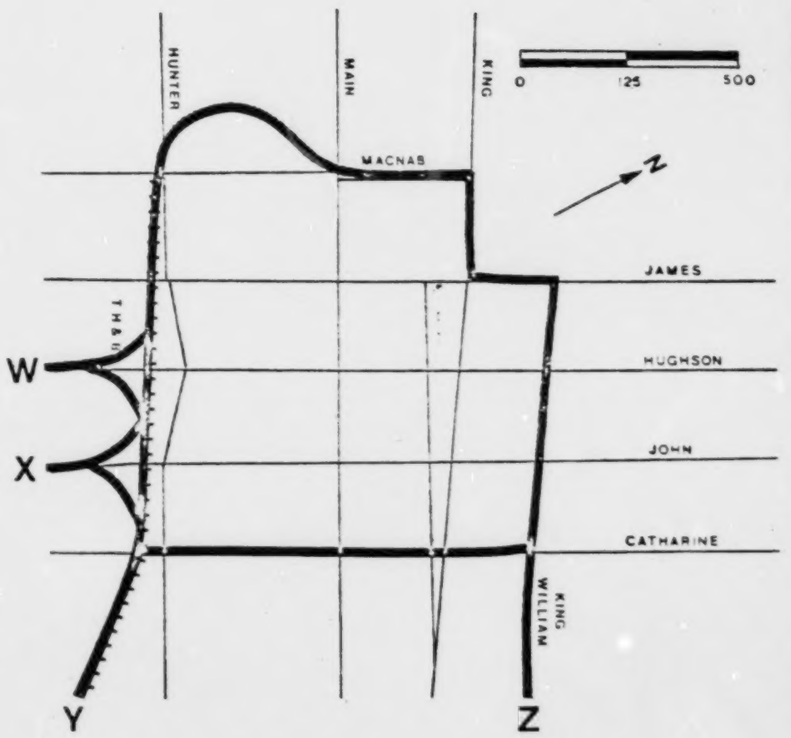
DOWNTOWN

The downtown segment of the rapid transit service is based upon a loop utilizing MacNab, King, James, King William, Catharine, the TH &B tracks, and City Hall.

Commencing at a station over the centre median of MacNab, the guideway curves over King to the north sidewalk adjacent to Jackson Square. The route curves over the west sidewalk of James and curves again over the south gutter of King William.

The guideway then crosses over to the north side of King William in the area of John to provide a straight section for a potential station east of John which could provide direct access to the future inter-regional bus terminal. From this station, the guideway curves onto the east side of Catharine, crossing King on an angle to the west side of Catnarine for a potential station at the Royal Connaught parking lot serving the King/Catharine area.

The route continues along the west side of Catharine to the TH &B tracks. It follows the south side of the TH &B right-of-way with a potential fourth station at the TH &B station. Near MacNab St. it crosses over the TH &B tracks and Hunter St. behind the Whitehern building and curves over the municipal parking lot of City Hall. Jackson St./Football Hall of Fame, and Main St. to the median island of MacNab St.



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ESCARPMENT CROSSING AND MOUNTAIN ROUTES

ROUTE W

In the area immediately east of Hughson St., Route W diverges from the common downtown part. Crossing over HayMarket St. and Beckley Dr. the guideway crosses over a parking lot to Augusta St. where it curves in front of St. Charles Garnier Church to the west gutter of Hughson St. Proceeding along the west side of Hughson St., it curves over Charlton Ave. E. to the parking lot of St. Joseph's Hospital.

Skirting the edges of the parking lot, a station is located in the area of James St. and Herkimer St. From this station, the route goes over the east boulevard of James St. to James Mountain Rd., where it uses the old incline railway right-of-way to approach the escarpment face. There it goes underground through a tunnel opening east of the Scout House. The tunnel runs under Upper James St., breaking ground immediately south of Fennell Ave. in the Mountain Mall parking lot, where the northern most Mountain station is to be.

On its extension to Mohawk Rd., the guideway continues over the plaza parking lot on the east side of Upper James St. and swings out into the centreline of Upper James St. This path is maintained to Richwill Rd., where the route curves onto the Miracle Food Mart plaza with a station located close to Mohawk Road.

The second construction stage would take the line east and south to reach the Regional sub-centre at Limeridge Rd. and Upper Wentworth St. The guideway would continue along the north boulevard of Mohawk Rd., swinging, into the contreline of Mohawk Rd. as far east as Sackville Hill Memorial Park. Here it swings to the north boulevard before curving to the east side of Upper Wentworth St. to proceed south to Limeridge Mall. Stations can be located at Upper Wellington St., Sackville Hill Memorial Park and in the Limeridge Mall area.

ROUTES X,Y, & Z - COMMON SEGMENT

From the face of the escarpment southerly, Routes X,Y, and Z, share a common route. From the area of the northerly tunnel opening (where the Jolley Cut crosses over the Claremont Access Rd.) these three routes run under the Upper Wellington St. to emerge from the tunnel in the centre of Upper Wellington St. immediately south of Inverness Ave. A station may be located under Concession St. and/or at Inverness Ave. From the southerly tunnel opening, the guideway uses the centre line of Upper Wellington St. to Fennell Ave. A station may be located over Upper Wellington St. immediately north of Fennell Ave.

On its extension to Mohawk Rd. from this station, the guideway is located in the centreline of Upper Wellington St. Immediately north of Mohawk Rd., curves to the east with a station located on the site of the Texaco Gas Station and Car Wash.

In second construction stage, the guideway would swing over to the centreline of Mohawk Rd. and use the same alignment as Route W to reach the Limeridge Mall Area.

ROUTE X

From the common downtown loop, the guideway for Route X is located over the west sidewalk of John St. At St. Joseph's Dr., it curves off John St. to the south boulevard of St. Joseph's Drive. A station is located in the southeast corner. The guideway continues over the south boulevard of St. Joseph's Dr., onto the old road allowance at the dead end of St. Joseph's Drive, over the Claremont Access Rd., under the Jolley Cut, and into a tunnel opening to join the common segment discussed in the section above.

ROUTE Y

From the common downtown loop, Route Y follows the [illegible] to the Claremont Access Road.

In the vicinity of Young St. at Wellington St., a station can be located to serve that neighbourhood and provide a potential express bus connection with the Bayfront Industrial Area. Curving from this station, the guideway continues along the west boulevard of the Claremont Access Rd. to a point immediately south of the Jolley Cut. It crosses over the Claremont Access Rd. to enter the Route Y tunnel portal below the Jolley Cut. Route Y then enters the common segment discussed above.

ROUTE Z

From the common downtown loop, Route Z runs along the south side of King William St. to Wellington St. where it curves over the west sidewalk of Wellington St. to approach King St. A station is located on the west side of Wellington St. between King St. and Main St. to serve this area of King and Wellington Streets. The guideway continues along the west boulevard of Wellington St. and the Claremont Access Rd. to join with the Route Y alignment discussed in the previous section.

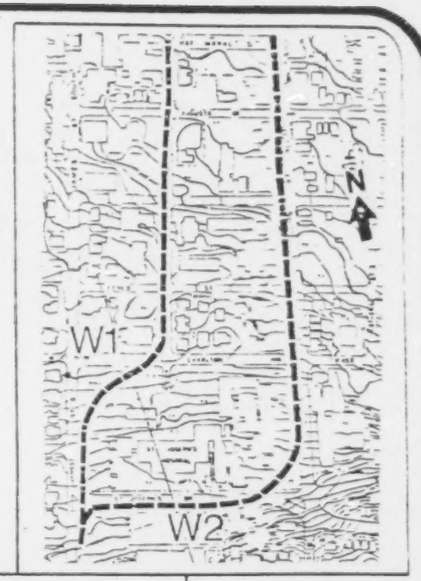
ROUTE OPTIONS

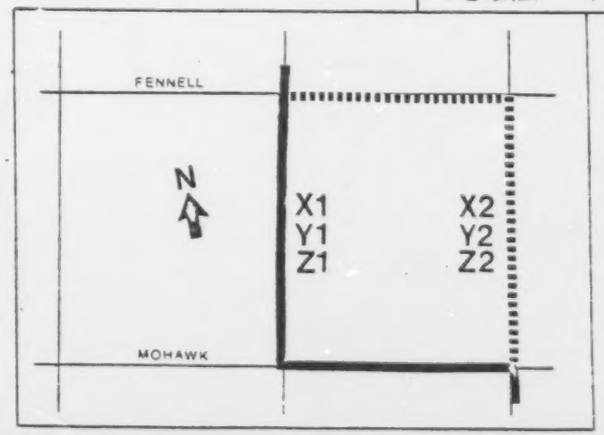
Within the four possible routes, other options exist. For example -- for Route W, it is possible to reach the tunnel opening at James St. S. from the downtown loop by using John St. and St. Joseph's Drive. For Routes X, Y, and Z, it is possible to reach the intersection of Upper Wentworth St. and Mohawk Road from Upper Wellington St. and Fennell Ave. by using Fennell Ave. and Upper Wellington St.

As well, within each route, some minor route variations exist. For Route W, it is possible for the guideway to go behind the St. Charles Garnier Church rather than in front of the church. Also, the tunnel opening on Upper James St. could be placed in the centre of the road, rather than on the Mountain Mall property. For routes, X, Y, and Z, the tunnel opening at Inverness could vary in location. All stations have options available, and an additional station could be considered for route W at Upper James and Inverness.

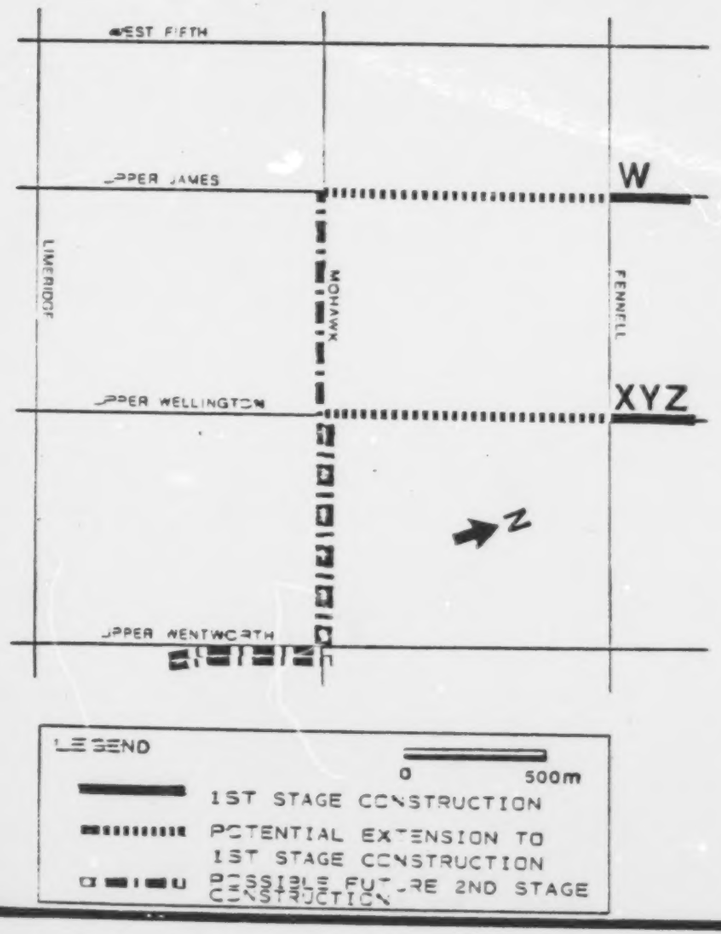
These options have not been reviewed in detail, as only the major differences amongst routes have been addressed. Once a preferred route has been selected by Council, the details of route options will be identified and highlighted in the preliminary design report. However, a recommendation has been prepared previously and passed to Council in favour of option W1, X1, Y1, and Z1.

Route W Options





Route X Y Z Options



STAGES OF CONSTRUCTION

The rapid transit system may ultimately link the downtown area, an established activity centre, with the new sub-regional centre developing in the vicinity of Upper Wentworth St. and Limeridge Rd. However, existing development and project construction occur in stages. For the purpose of this report, Stage 1 terminates at Fennell Ave., with a possible extension to Mohawk Road. Stage 2 would link Stage 1 to the sub-regional centre at the Limeridge Mall. While this report concentrates on Stage 1, details are provided for Stage 2 as well.

ROUTE

DIFFERENCES

FACTOR	PAGE
COST	
RIDERSHIP	
POTENTIAL STATION SITES	
TRAVEL TIME	
SURFACE TRANSPORTATION	
PROPERTY REQUIREMENTS	
CONSTRUCTION	
VISUAL PERSPECTIVES	
DEVELOPMENT POTENTIAL	
NATURAL ENVIRONMENT	
FUTURE EXPANSION	

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COST

CAPITAL COST

The cost to build each of the four rapid transit lines is shown in the table opposite. These costs are based on the very preliminary designs completed to date, and on Metro Canada's experience, and that of its sub-consultants, in preparing cost proposals and construction contracts for similar systems in other cities.

In addition to the cost of the vehicles, running hardware, structures, stations, maintenance facilities and related items, these estimates include the cost of design, engineering, administration, staff training, land acquisition, and modifications to existing utility systems. The estimates also include a 20% contingency allowance to cover unforeseen expenditures. As the preliminary design for the preferred route is completed in coming months, the need for this large contingency will be reduced.

The major item of capital cost is the guideway and running structure, including the tunnel section of each route. Typically, this item accounts for close to 50% of total costs. The total of all infrastructure items -- guideway, stations, utility locations, maintenance facilities and power distribution systems -- is approximately 55% of the total cost. This figure represents the minimum of the project to be constructed locally and represents at least 2,000 man-years of construction employment for Hamilton-Wentworth. More local jobs will be created to help supply system hardware and components, particularly provision of steel items for the guideway and stations.

CAPITAL COSTS

ROUTE	W	X	Y	Z
TO FENNELL AVENUE				
GUIDEWAY	$35.2	$28.4	$31.1	$34.4
STATIONS	4.6	6.8	6.8	6.8
UTILITY RELOCATION	1.9	3.0	3.0	3.4
MAINTENANCE FACILITY	7.1	7.1	7.1	7.2
VEHICLES	6.9	6.9	6.9	8.6
COMMAND AND CONTROL	7.1	7.1	7.1	7.3
POWER DISTRIBUTION	3.6	3.8	3.8	4.0
ENGINEERING & TESTING	4.8	4.8	4.8	4.8
FINAL DESIGN	3.7	3.4	3.6	3.9
PROJECT ADMINISTRATION	5.7	5.4	5.7	6.1
MISCELLANEOUS ITEMS	5.0	5.0	5.0	5.0
CONTINGENCY (20%)	17.1	16.3	17.0	18.3
TOTAL	$102.6	$98.1	$101.9	$109.9
EXTENSION TO MOHAWK ROAD				
ADD	$8.5	$15.3	$15.3	$15.3
TOTAL	$111.1	$113.4	$117.2	$125.2

TRANSIT SUBSIDIES

The Government of Ontario has proposed to the Government of Canada that the two senior governments jointly fund 90% of the total capital cost of the Hamilton-Wentworth rapid transit service now under study. If this proposal is acted on and should the Region choose to build this rapid transit service, then the Regional share of the capital cost would be 10% of the total shown opposite.

The Government of Ontario also provides subsidies for the operation of transit systems. In addition to the regular operating subsidies that assist all transit systems, rapid transit systems built in advance of mature ridership demands can be eligible for special, additional subsidies if the municipality institutes zoning and development practices that support rapid transit.

OPERATING COSTS

(1ST QUARTER, 1981)

($MILLION; 1ST QUARTER, 1981)

ROUTE	W	X	Y	Z
1986				
TO FENNELL	3.2	3.2	3.2	3.2
TO MOHAWK	3.4	3.3	3.3	3.4
2001				
TO FENNELL	3.6	3.5	3.6	3.5
TO MOHAWK	3.8	3.7	3.8	3.7

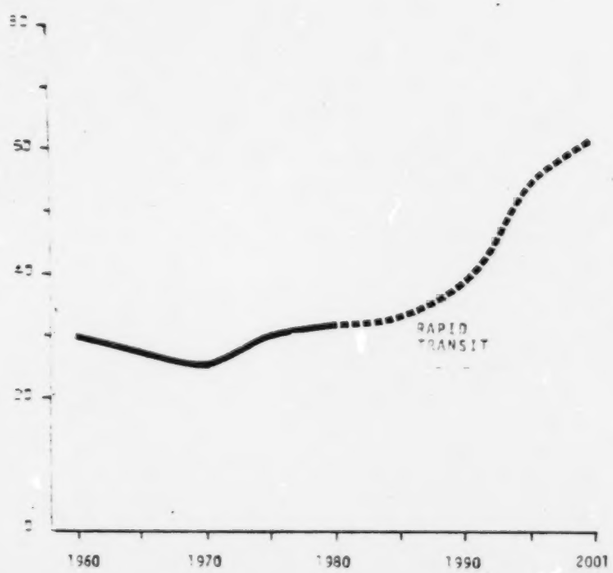
OPERATING COST

The costs of running the rapid transit service have been estimated for each of the possible routes. These costs include operating, supervisory and maintenance personnel, including transit staff at each station during all operating hours. Station staff will collect fares, assist the public, supervise the stations, support fire and police departments in response to any emergency.

Operating costs show little difference among the four routes, as the number of stations on each route, vehicle, and maintenance staffs required, are similar for all routes.

The operating costs do not include adjustments to account for changes in the cost of operating the bus system. As passengers shift from buses to rapid transit, the cost of operating the bus system will decrease. However, the introduction of rapid transit systems usually results in an overall shift from cars to transit. This shift which has not been included in the minimum ridership estimates, would result in increased use of the bus system and increased bus operating costs. The effect of these two counter-balancing shifts has not been calculated.

RIDERSHIP



PROJECTED HSR TRANSIT RIDERSHIP

RIDERSHIP FACTORS

The number of transit riders will depend on such factors as:

- o increasing costs of operating a car,
- o increasing traffic congestion, particularly on the escarpment crossings,
- o activity centres near stations,
- o population changes near stations,
- o service areas of buses,
- o increasing costs of operating a car,
- o changing public attitudes towards transit and cars,
- o population and job growth,

MINIMUM RIDERSHIP ESTIMATES

The estimates shown here represent the minimum ridership to be expected on the rapid transit system. A fully utilized road system with minor widenings at the base of the escarpment has been assumed, with trips that cannot be made on the road system being assigned to rapid transit. No allowance has been made for passengers who would be attracted to rapid transit by convenient service and lower cost. This shift from autos to transit normally results in substantial ridership increase above the estimated minimum.

TRANSIT IN THE MOUNTAIN CORRIDOR

The Regional Council of Hamilton-Wentworth has adopted a pro-transit policy to encourage increased transit use, particularly for the crossing of the escarpment. In the corridor which links the Downtown to the Mountain, transit ridership now represents approximately 40% of all transit trips to and from the downtown core.

Approximately 7,000,000 passengers per year now cross the escarpment in this corridor by transit. By the year 2001, -- 20 years from now -- it has been estimated that approximately 20,000,000 passengers a year will cross the Escarpment on this corridor by some kind of public transit.

The projected population growth on the Mountain in the area of the sub-regional centre and the continued growth of the Downtown as a major employment centre will cause increased traffic congestion on the Mountain access roads. The transportation needs of many of these people can only be served by using a transit system which is separated from existing roads on its own right-of-way.

TRANSIT INTERFACE

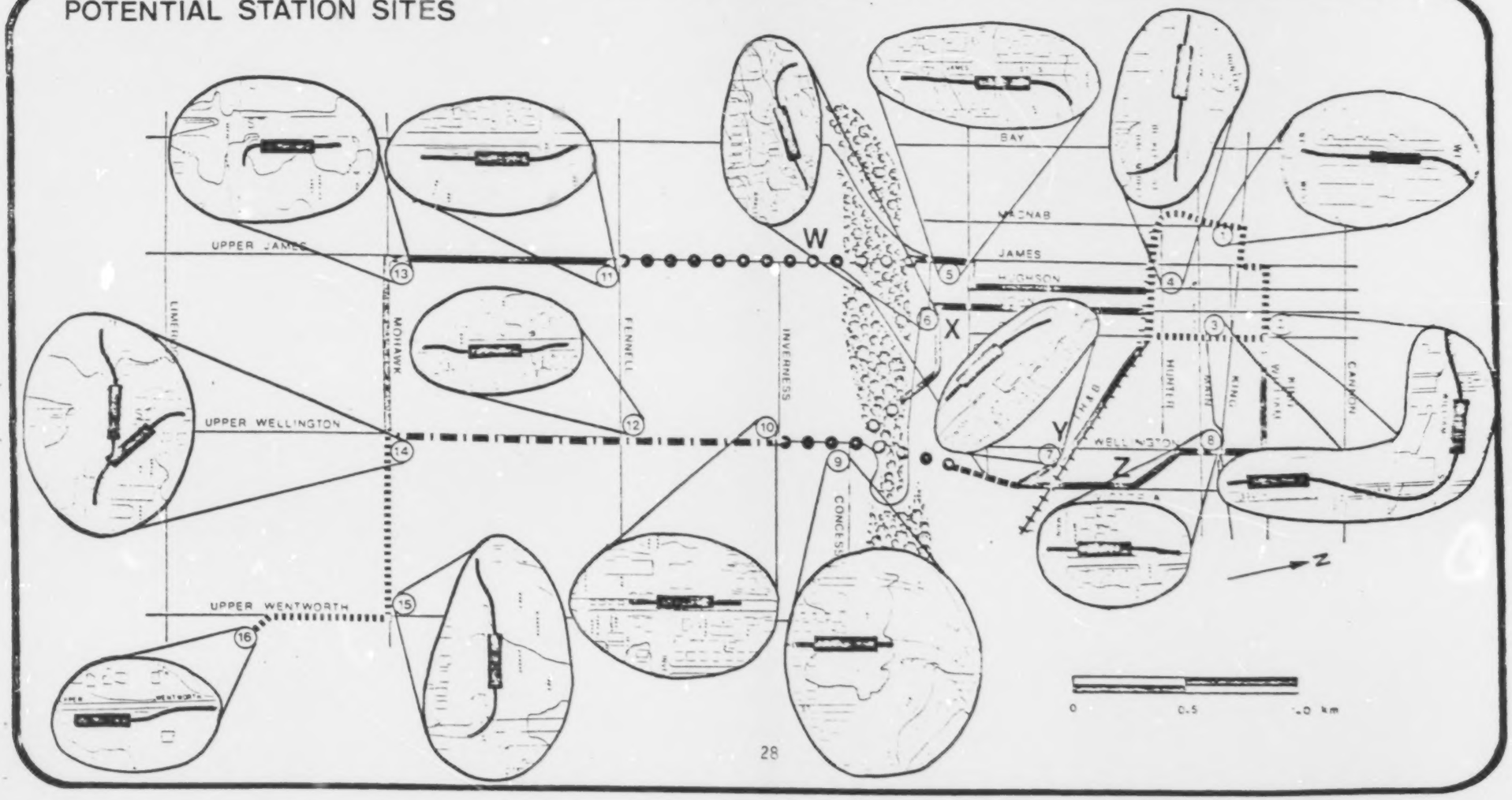
The number of riders of rapid transit will depend to a large extent on the convenience of transfers to and from other means of transportation. All routes, for example, provide excellent service to the downtown activity centres, and include the potential to serve the future inter-regional bus terminal and a possible relocated GO train station. Special express bus service can also be provided along various routes to connect to other major centres such as Mohawk College and the Bayfront Industrial area.

All major transfer facilities will offer weather-protected waiting areas, and transfers between buses and the rapid transit will be free.

RAPID TRANSIT ANNUAL RIDERSHIP

		W	X	Y	Z
TO MOHAWK OR FENNELL	1986	8,200,000	8,554,000	8,382,000	8,417,000
	2001	19,512,000	22,329,000	20,305,000	20,592,000

POTENTIAL STATION SITES



STATION LOCATION

To make the rapid transit system as attractive to potential transit users as possible, stations have been located close to major activity centres to minimize walking distances. Major intersections are also served by stations to minimize out-of-way passenger and bus travel and to serve the major transportation corridors. Where needed, bus transfers are "paper free" and weather protected to enhance passenger convenience.

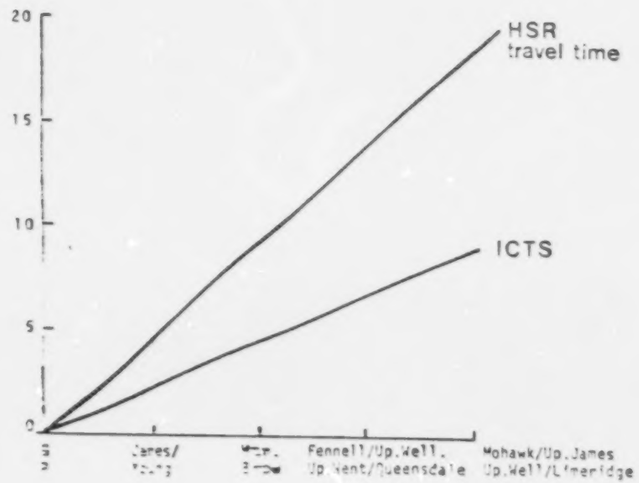
STATION DESIGN

Site-specific station designs will depend upon final design requirements of the preferred route. However, stations are generally 12m x 55m (40' x 180') in dimension with passenger access to the platforms by escalators and stairwells. The majority of rapid transit users will transfer from buses or will walk in from areas adjacent to the stations. Some "kiss 'n ride" facilities may be desirable; however, major parking facilities have not been designed for the Stage 1 system.

FACTOR	LINE	W	X	Y	Z
ACTIVITY CENTRES SERVED	Fennell	o St. Joseph's Hospital o Durand/Corktown Professional/ Commercial o Mohawk Mall	o St. Joseph's Hospital		o King/Wellington development node
	Mohawk				
BUS SERVICE	Fennell	o Some Valley bus buses remain	o All Valley bus buses removed	o Express bus service to Industrial Area o Valley bus/St. Joseph's bus route to remain	o Express bus service to Industrial Area o East-west lower City bus service o Valley bus/St. Joseph's bus route to remain
	Mohawk				
RESIDENTIAL WALK-IN POTENTIAL (SERVICE AREA)	Fennell	1326	2433	2433	2433
	Mohawk	2722	4618	4618	4618

NOTE: EXPRESS BUS SERVICE CAN BE PROVIDED TO MOHAWK COLLEGE FOR ALL ROUTES

TRAVEL TIME



1991 COMPARABLE TRANSIT TRAVEL TIMES

Because the Intermediate Capacity Transit System (ICTS) is elevated in most circumstances, it is not affected by elements that normally delay buses and streetcars which operate on streets. High traffic volumes, traffic signals, construction, traffic collisions, and inclement weather will not increase the travel time for rapid transit. Therefore, there will be a virtually guaranteed travel time from any station on the system to any other station. This is a very attractive and convenient feature for the commuter.

Actual travel times will vary by route length. In general terms, however, ICTS trains will run at two to three times the current operating speeds of buses. As the Mountain community and the Downtown develop further, the road network and Mountain access routes will become increasingly congested and bus operating times will likely suffer. The rapid transit service will, however, maintain its operating schedule.

Bus routes will be changed to take advantage of the rapid transit service. Bus routes on the Central Mountain and in the Downtown area will be re-organized to feed passengers directly into the rapid transit stations. Transfers between buses and rapid transit are weather protected and direct to ensure passenger comfort and convenience. Waiting time for both rapid transit and surface transit will be reduced at stations due to high train frequencies and increased level of service for buses.

RAPID TRANSIT TRAVEL TIME*

FROM MACNAB ST. STATION

	W	X	Y	Z
To Fennell	6 min	6.5 min	6.5 min	7.5 min
To Mohawk	8 min	8 min	8 min	9 min

* assumes 20 sec. dwell time at stations

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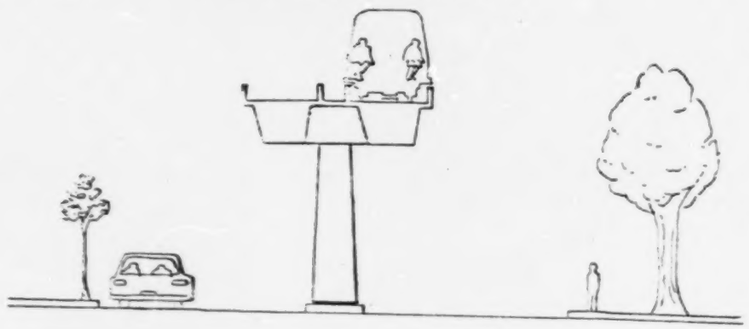
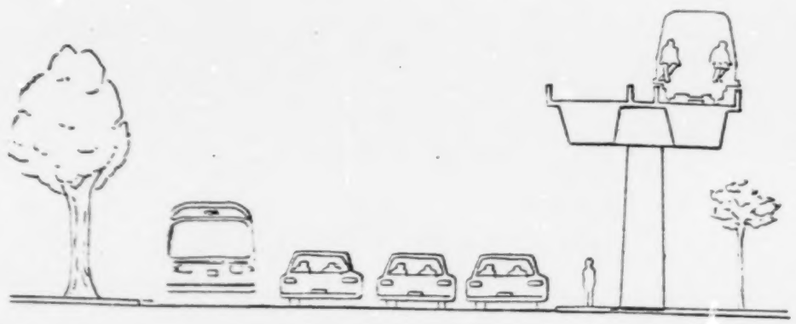
SURFACE TRANSPORTATION



Typical Centreline Location



Typical Streetside Location

Through the public participation program of this study, a common perception has been identified that columns to support the guideway may interfer a great deal with existing roads. In fact, columns are typically two feet by five feet in size and placed 100 feet (30 metres) apart. As a result, interference with surface transportation is kept to a minimum.

ROADS

Maximum safety requirements must be upheld in planning guideway columns. For columns placed within the travelled portion of roads, minor road widenings, generally back to the edge of the existing sidewalks, must occur. For boulevard locations, no traffic lanes are used.

Column placement within relatively narrow rights-of-way, may reduce visibility for vehicles turning left, by blocking the view of approaching traffic. Areas where this problem may occur have been identified and are shown opposite. Where sufficient rights-of-way are now, or will be, available, median widths or off-set columns can be placed to provide adequate visibility for side streets.

PEDESTRIANS

By careful placement of columns and some sidewalk relocation, all pedestrian flows are maintained. In the downtown, the MacNab Street station will provide a major link with the proposed "Plus 15" elevated walkway level. The guideway design can be adjusted to accommodate the "Plus 15" walkways where crossings occur.

RAILWAYS

Where routes follow the TH &B tracks, columns may be located in the railway right-of-way without effect on the existing railway operations.

TRANSIT

The present HSR bus routes will have to be realigned to complement the rapid transit service. Thus, the majority of bus routes now crossing the escarpment to the south of the downtown will act as feeder bus routes into rapid transit stations. North-south routes which now run along Upper James St. or Upper Wellington St. will provide local service as rapid transit replaces their downtown connector function. As well, special express buses to major activity centres such as Mohawk College and the Bayfront Industrial Area may be implemented. Where walking distances between stations are too long local shuttle bus services will be provided.

TRAFFIC CONTROL

Where the guideway blocks the view of traffic control signals, the traffic signals will be relocated, or secondary signal lights can be added. It is possible to mount traffic signals along the guideway.

PARKING SPACES

Some route segments use both on-street and off-street parking areas for the guideway route. Few on-street parking spaces will be lost, as it is possible to park under the guideway because columns are typically placed every 30 m (100') apart. Some stations are located in parking lots and extra space may be required for bus turn-arounds. This would reduce the number of off-street parking spaces at these locations.

POSSIBLE LEFT TURN RESTRICTIONS
CUMULATIVE

		W	X	Y	Z
To Fennel	HOMES:				
	Houses	0	189	189	189
	Apartments	0	33	33	33
	Extra Travel	0	209 m/day	209 m/day	209 m/day
	Commercial Units	0	48	48	48
To Mohawk	HOMES:				
	Houses	231/135	417/450	417/450	417/450
	Apartments	62	33	33	33
	Extra Travel	167 m/day	664 m/day	664 m/day	664 m/day
	Commercial Units	6	49	49	49

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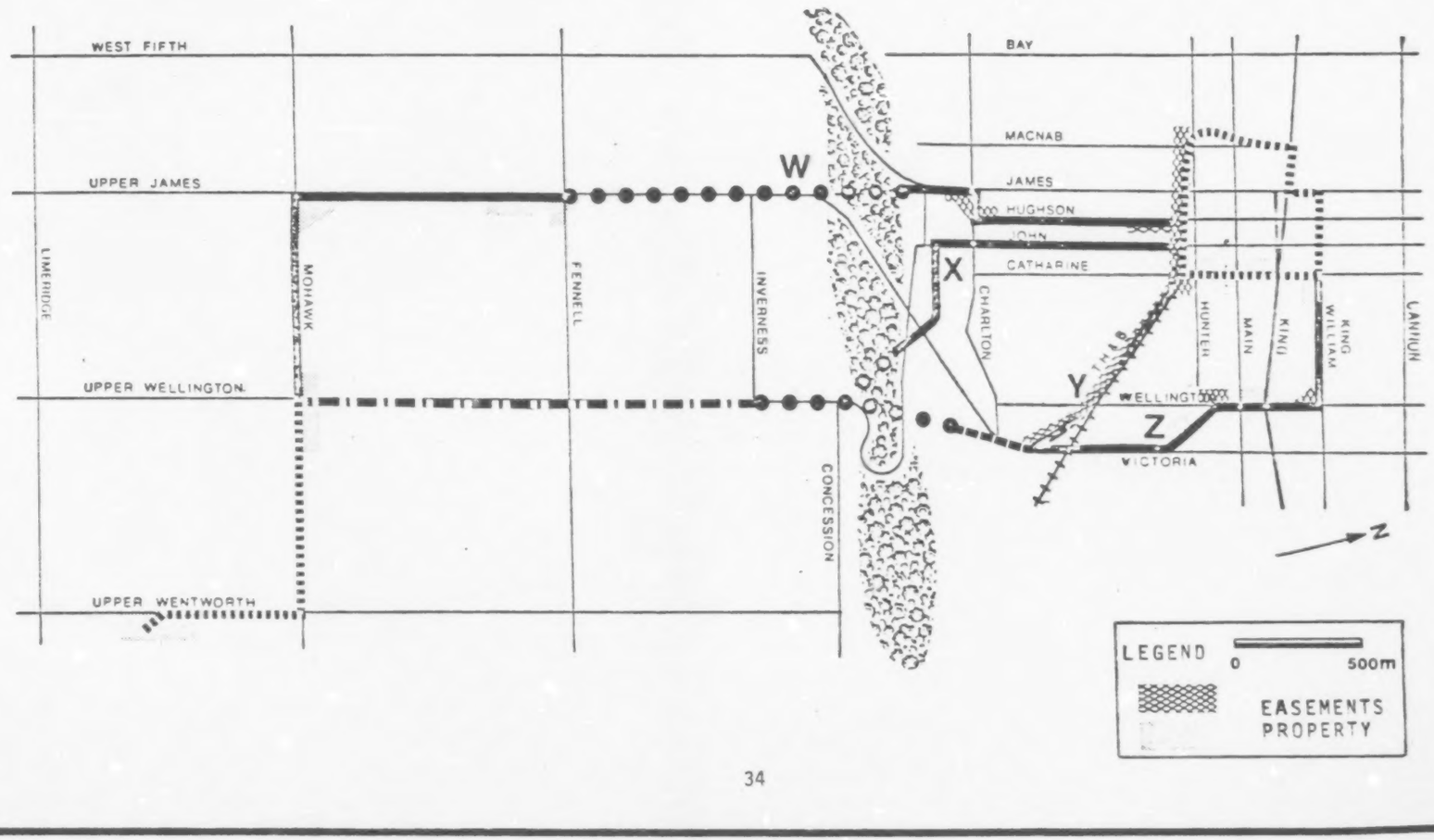
PROPERTY REQUIREMENTS



The ICTS form of rapid transit has been designed to minimize the requirements for private property.

GUIDEWAY

In most cases the guideway can be constructed within the existing rights-of-way. In some cases, where the guideway turns or where the streetscape is more sensitive than the adjacent property, some private property or air rights may be required.

STATIONS

Stations are somewhat wider (40-45 feet) than guideway sections and may also require additional land area for such facilities as bus loops and "kiss 'n ride" areas. Some private property may be required at station locations.

REQUIREMENTS

Areas where private property may be required are identified on the map. Actual property requirements will depend on the number and exact location of stations and on the final design of the preferred route.

PRIVATE PROPERTY REQUIRED

	W	X	Y	Z
TO FENNELL				
Residential	6 units	5 units	1 unit	6 units
Commercial	6 businesses	1 business	1 business	3 businesses
Parking	1.25 acres	.23 acres	23 acres	1.16 acres
TO MOHAWK				
Residential	-	2 units	2 units	2 units
Commercial	-	1 business	1 business	1 business
Parking	2.32 acres	-	-	-

EASEMENTS

Because the ICTS is elevated, it is not necessary to acquire surface property rights in all cases. It is often possible to acquire air rights or other easements rather than the property itself. This may also apply to some tunnelled sections.

GUARANTEED PRICE

The Region has requested that consideration be given in this study to the purchase, at market value, of properties fronting the preferred route if the rapid transit system is built. This is a practice that has been followed successfully in other municipalities.

CONSTRUCTION

METHOD

Local impacts will occur as a result of construction of the rapid transit service. Guideway columns will be pre-cast and erected on footings fixed to bedrock. Once the columns have been placed, pre-cast guideway sections can be erected by crane. By using pre-constructed sections, time, money and public inconvenience can be kept to a minimum. Special noise muffling devices, dust control, and selected working hours can also be implemented in sensitive areas.

DURATION

As mentioned, the use of special materials can minimize the duration of construction at specific locations. The average duration of work at any typical site would be one month. Special construction areas such as on curves and on the escarpment will involve longer periods of time.

TUNNELL

Engineering studies support the feasibility of tunnel construction through the escarpment. The typical method of tunnelling will involve mole-augering equipment working from the base of the escarpment to the top of the Mountain. The tunnel opening on the escarpment face will be reinforced to strengthen the rocks. Within the tunnel, anchor bolts can be used to reinforce the rock above the escarpment. Waste rock will be trucked away to a suitable disposal site.

UTILITIES

Local utility disruption will occur where footings are being placed. This will involve service relocations and temporary supports. Where conflicts with major service lines, complete relocation of that service may be more appropriate than jogging at each column. Modern construction methods dictate that service disruptions are very short in duration.

STREETS

At construction sites, road traffic disruption will occur. However, no complete road closure will be necessary. Construction sites will typically use two lanes of traffic. To erect the guideway, a temporary traffic stoppage will have to occur to swing the beams over the road to rest on the top of the columns. All work areas will be properly signed and controlled by flagmen.

TIME IN YEARS

DESCRIPTION	0	1	2	3	4
PREPARATORY					
LINE CONSTRUCTION					
STATION FINISH					
FIXED HARDWARE					
REVENUE SERVICE					●

DESIGN AND CONSTRUCTION SCHEDULE

MAJOR CONSTRUCTION IMPACTS

		X	Y	Z
TRAFFIC	Fennell	Open cut approx. 1000 north of Fennell Ave.	John St. reconstructed from Mountain to TH 53	Wellington St. from King William to Main St.
			Upper Wellington from Inverness to Fennell	Upper Wellington from Inverness to Fennell
	Mohawk	. Centreline of Upper James	Centre 2 lanes of Upper Wellington	Centre 2 lanes of Upper Wellington
TRANSIT	Fennell	. All buses on John St. . Upper Wellington bus	. Upper Wellington bus	Upper Wellington bus
	Mohawk	. Upper James bus		

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RESEARCH UNIT FOR URBAN STUDIES
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VISUAL PERSPECTIVES

Generally, there are three types of urban design problems that are considered to be most difficult due to the sensitivity of of the existing conditions. These types are: (1) low-density stable single-family residential areas; (2) historic buildings and landmarks or sensitive institutions; and (3) the face of the escarpment, particularly where there are existing public views of the natural face. Two types of visual intrusion considered were (1) the invasion of privacy due to a new elevated public vantage point and blockage of views from windows due to the proximity of the guideway to buildings and windows; and (2) the importance of views severed by the guideway. These impacts are located on the map opposite.

INVASION OF PRIVACY

In order to measure invasion of privacy, residential units with second and third storey levels where public views from buses and sidewalks do not exist were considered most sensitive. Other indoor uses such as offices and institutions do not afford the same degree of privacy as a private home. Second and third storey dwelling units within 100 feet of the guideway were included in the table on this page as a measure of differences among routes. This distance is based on studies which have shown that beyond 100 feet, human features are difficult to recognize.

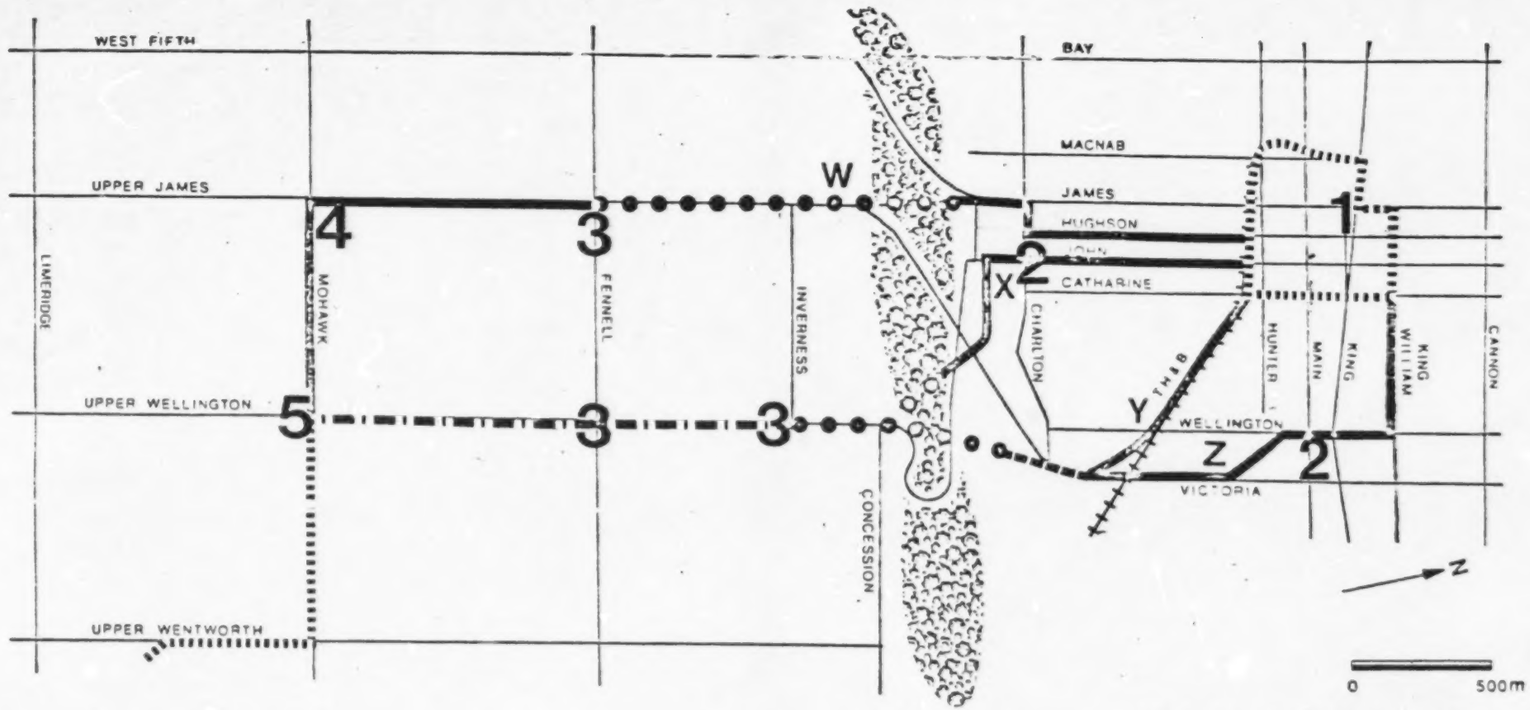
INTERFERENCE WITH VIEWS

The addition of the ICTS guideway to urban areas will interfere with some existing views available from windows of nearby buildings. The closer the guideway is to the buidings, the greater the reduction of present views. A 50-foot standard was used to compare alternatives in the table below. In defining the views affected, units on the lower three floors of buildings with windows facing the guideway were counted.

FACTORS		ROUTES W-	X	Y	Z
INVASION OF PRIVACY					
# of dwelling units 100' from guideway	F	32	33	35	59
	M	57	158	70	94
# of hotels	F	3	3	3	3
	M				
# of hospital/nursing home rooms	F	0	64	0	0
	M				
INTERFERENCE WITH VIEWS					
# of residential units within 50' of guideway	F	20	64	51	50
	M	31	115	102	101

F = FENNEL M = MOHAWK

DEVELOPMENT POTENTIAL



STATION LOCATIONS WITH DEVELOPMENT POTENTIAL

DEVELOPMENT POTENTIAL

Rapid Transit, because of the increased accessibility and service that it provides can become an important development catalyst. This occurs particularly at transit focal points and station locations.

In its Official Plan, the Region calls for the Hamilton Central Business District to continue to be the primary focal point of transit in the Region with a level of service which will provide improved accessibility and which will reduce the need for automobiles downtown. The sub-regional center is to become the focal point for transit above the Mountain.

In addition, it is the policy of the Region, as expressed in the Official Plan, to encourage the Area Municipalities to allow higher density residential development in "immediate proximity to transit corridors and transfer points".

Areas with the greatest potential for further development which will be mutually supportive of rapid transit service are large assemblies of developed land, vacant or under-utilized land and areas where there are precedents for high density or intense development.

DEVELOPMENT POTENTIAL

	W	X	Y	Z
1. Downtown	common station location/development potential for all alignments			
2. Downtown fringe	intensification of development near St. Joseph's Hospital		redevelopment of TH and B/ Wellington South area	intensification redevelopment in King/Wellington area
3. Cannon/ and Fennell	opportunities for intensification, use of air rights at Mall	possible joint development with station at Cannon, minor redevelopment opportunities at Fennell		
4. James/ Mohawk	opportunities for intensification, use of air rights at Mall	-	-	-
5. Wellington/ Mohawk	common station location/ common development potential for all alignments			

NATURAL ENVIRONMENT

Environmental differences among the four routes consist of impacts on mature, replaceable trees, geology, soils, hydrology, wildlife, air quality, and climate. It has been determined that the impacts on soils, hydrology and climate are constant and minimal for all four routes. Therefore the following characteristics represent the important differences.

TREES

In the table opposite the number of mature and replaceable trees, both removed or possibly removed, are summarized for routes W, X, Y and Z. Mature trees are defined as trees having a 4 inch or greater diameter 4.5 feet from ground level. Replaceable trees measure less than 4 inches at this height and can be easily transplanted. Route W has the greatest number of mature trees removed because of the location of a tunnel opening in a forested area of the escarpment. All other tunnel openings occur in unforested sections of the escarpment.

WILDLIFE

In order to consider impacts to wildlife, a number of criteria have been selected for a qualitative evaluation based on the extent of vegetation removed, the environmental setting, loss of feeding areas, loss of cover, restriction to movement, impact on rare/endangered species and impact on species diversity. Major differences between routes occur at the escarpment tunnel opening on W where loss of cover and feeding area will be more extensive than X, Y or Z. Both W and X will have moderate impacts on the removal of feeding areas and cover in their respective lower plateau areas. Route Y has a moderate impact on feeding areas along the TH&B right-of-way.

GEOLOGY

The principle impacts on local geology relate to geologic processes, bedrock and slope stability, especially along the Niagara Escarpment. Although many of the construction impacts on geology are similar, differences do occur where routes traverse varying sections of the escarpment. These impacts are expected to be moderate on routes X, Y, Z and minimal on route W.

AIR QUALITY DURING CONSTRUCTION

Existing ambient air quality conditions were considered in estimating the ability of an area to accept additional concentrations of fumes and dust during construction. From these calculations, X is the route with the least ability to accept more fumes and dust emissions during construction. However, the area on X immediately below the escarpment will benefit the most in terms of air quality once construction is completed. This would result from taking most of the buses off the Jolley Cut when a rapid transit service is installed.

FACTORS		ROUTE			
# OF MATURE TREES REMOVED	F	118	27	17	20
	M	1	10	10	10
Total		119	37	27	30
# OF MATURE TREES POSSIBLY REMOVED	F	0	0	0	1
	M	0	0	2	0
Total		0	0	2	1
# OF REPLACEABLE TREES REMOVED	F	44	51	23	47
	M	+4	+23	+23	+23
Total		48	74	46	70
# OF REPLACEABLE TREES POSSIBLY REMOVED	F	2	13	0	1
	M	0	0	0	0
Total		2	13	0	1

F = Fennel", M = Mohawk

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FUTURE EXPANSION

RAPID TRANSIT TO THE SUB-REGIONAL CENTRE

The rapid transit study work program includes the analysis of the characteristics of a potential future second construction stage from the end of the first rapid transit link at either Fennell Avenue or Mohawk Road to the planned sub-regional centre at Limeridge Road and Upper Wentworth Street. The characteristics of this second stage have been analyzed and are presented here for information.

STAGE 2 SEGMENT
MOHAWK TO THE SUB-REGIONAL CENTRE

ROUTE	W	X	Y	Z
Capital Cost	$ 32,200,000	$ 17,900,000	$17,900,000	$17,900,000
Operational Cost				
[illegible]	550,000	230,000	230,000	230,000
[illegible]	520,000	470,000	470,000	470,000
Rapid Transit Annual Ridership				
[illegible]	9,250,000	8,487,000	8,400,000	8,451,000
[illegible]	19,534,000	20,310,000	20,349,000	20,576,000
Activity Centers Served	All alignments serve the Mountain Regional Sub-Center			
Bus Service	Sub-Center Bus Routes	Sub-Center Bus Routes	Sub-Center Bus Routes	Sub-Center Bus Routes
Residential Walk-In Potential (Service Area)	5832	5543	5543	5543
Rapid Transit Travel Time (from MacNab St. Station)	12 min	11 min	11 min	12 min
Possible Left Turn Restrictions				
Houses	127	39	39	39
Apartments	939	565	565	565
Extra Travel	4727 m/day	2454 m/day	2454 m/day	2454 m/day
Commercial Units	1	1	1	1
Private Property Required				
Residential	2 units	-	-	-
Commercial	7 business	-	-	-
Parking	0.19 acres	2.19 acres	2.19 acres	2.19 acres
Major Construction Impacts				
Traffic	Mohawk - Upper James to Upper Wentworth	Mohawk - Upper Wellington to Upper Wentworth	Mohawk - Upper Wellington to Upper Wentworth	Mohawk - Upper Wellington to Upper Wentworth
Transit	Mohawk Bus	Mohawk Bus	Mohawk Bus	Mohawk Bus
Visual Perspectives				
Invasion of Privacy - # of Dwelling Units within 100' of Guideway	196	271	173	197
Interference with Views - # of Residential Units within 50' of Guideway	113	196	183	192
Development Potential				
Sackville/Limeridge Stations	Major Development Potential a Sub-Regional Center for all Alignments			
Natural Environment				
# of Mature Trees Removed	13	4	4	4
# of Mature Trees Possibly Removed	2	2	0	2
# of Replaceable Trees Removed	5	0	0	0
# of Replaceable Trees Possibly Removed	0	0	0	0

FUTURE EXTENSIONS

If the proposed rapid transit service is constructed in the Mountain Corridor, possibilities for future expansion to other areas of the municipality are available. The computer control system is designed to accept future connections or line extensions and the downtown loop will be designed to accommodate service extensions in any direction. This will permit expansion to any area requiring improved transit service in the future.

INDUSTRIAL AREA

The Bayfront Industrial Area, which has now the largest concentration of the work force of Hamilton-Wentworth, does not represent a large percentage of current transit riders. As changing circumstances affect public attitudes towards transit, transit ridership to this area will likely increase. With the implementation of the transportation strategies presented for the preferred alignment, transit ridership may increase more quickly than anticipated. As ridership increases, a rapid transit service to this area may be considered.

OTHER AREAS

With future growth and development, transportation needs could dictate improved transit services in a number of corridors radiating out from downtown. Areas such as McMaster University, the sub-regional centre to the east, the East-West Arterial Road, Red Hill Creek, and the Hamilton Airport are candidates for future rapid transit services. A number of these options have been identified in past studies.

GENERAL

RAPID TRANSIT

ISSUES

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PROPERTY

Experience in other cities has shown that property values to rapid transit lines do change.

Minor short-term decreases in value may be anticipated at some locations along a rapid transit line, but substantial increases in value may be anticipated in the vicinity of stations.

For example, in Toronto there has been a substantial long-term increase in property values on the rapid transit lines and along the bus routes which feed rapid transit stations. This has occurred especially where rapid transit has encouraged development.

EXPROPRIATION

ICTS technology was developed to minimize the need for acquisition of private property. In most cases the guideway can be constructed within rights-of-way of existing streets. In some cases, however, particularly at stations and guideway turns, some private property or air rights may be necessary.

REQUIREMENTS

Property requirements for the ICTS are essentially those for columns and footings at regularly spaced intervals. These will normally be located on property already owned by the municipality and on road allowances.

COMPENSATION FOR LOSS

Under Ontario law, property owners whose property or property rights are required for public purposes must be adequately compensated. Where they feel that a public body has not made an adequate offer for their property, they can require that the public body expropriate their property, that appraisals be made, and that the value be established by a special tribunal.

ECONOMICS & MUNICIPAL FUNDING

TAX IMPACT

The Region's share of the capital costs of an Intermediate Capacity Transit System would be 10%, according to the proposal put forward by the Government of Ontario. To finance its share of large capital projects, the Region has traditionally raised debentures over 10 to 15 years.

The annual debt servicing on these debentures is usually financed through property tax levies. The amount of levies required will be determined for the preferred value.

SUBSIDIES

Transit systems are an increasingly important part of the city infrastructure. The traditional alternative to transit services has been more and more arterial road capacity. A portion of these road costs are met by the province. The province also provides regular operating subsidies for transit operating costs. Where transit is provided by electricity, the subsidy is increased. Special subsidy arrangements are also available for rapid transit systems built to assist and direct development.

These subsidies are offered to promote a balanced transportation system and increased use of public transit.

IMPACT ON BUSINESS

Impacts on businesses during ICTS construction are minimized due to the design of the guide-way and use of prefabricated components. In addition, experience in major North American cities has shown that signage, rearranged traffic patterns, temporary parking facilities and marketing techniques can minimize adverse effects during construction of major public projects.

Some changes to business patterns may be evident after construction has been completed and the system opened for service. While there may be some decrease in business for those who depend on opportunity, automobile traffic, business activity downtown and near-station locations will intensify due to the increased accessibility of these areas.

JOB CREATION

During construction of a typical $100 million, rapid transit service, approximately 700 construction workers will be required over a period of approximately 3 years. Income from these jobs will spread throughout the community and, through the economic multiplier effect, make an important contribution to the service sector of the region's economy.

ACCESS

Rapid transit riders will arrive by car (drop-off), bus, and on foot. Parking spaces have not been provided for in the design of station areas. The majority of transit riders will arrive by bus or by walking. As transit useage increases, "kiss 'n ride" drop off areas may be advisable.

At the station, fare collection areas will have attendants for walk-in transit users. For bus transfers, direct transfer facilities can be designed to allow free movement from the bus to the rapid transit platform.

The means of access to the platform of an elevated, or below grade, rapid transit station will be by automatic escalator. Back-up stairways will be provided. This will permit the rapid transit system to be used by all people who now use the existing HSR bus service, including the elderly and the ambulatory handicapped. It is understood that the patrons of the Region's DARTS system will continue to use that system.

The ICTS rapid transit system is designed to permit trains to run as often as every 60 seconds. Therefore, once a transit user has reached the station platform, he or she will have a very short wait. Actual train operating times will depend on the service levels recommended for the final system design and will change with time. Ridership, operating time, and operating budget will influence the level of service chosen. However, it must be recognized that the higher the level of serivce, the more attractive the transit will become for potential transit users.

Access to major activity centres is being taken into consideration in this study. No single route can satisfy all of the travel requirements of all persons in the study corridor. However, a transportation strategy can be adopted to provide improved service to areas which generate a large number of trips. Although the rapid transit corridor under study as identified by the Region, does not include the major industrial area of Hamilton, improved transit services, such as express bus service and new bus routes to the Bayfront Area, are being considered as part of this study.

STREET FIT

An elevated guideway will change the appearance of any street where it runs. The visual intrusion perceived by the human eye, however, will vary among individuals and therefore is subjective and difficult to define.

Intrusion can be grouped into two categories: (a) the view of the structure; and (b) the view from the train on the guideway. In the first case, the neighbouring property owners are affected by the appearance of the structure and shadows cast by the structure. ICTS technology involves light-weight rail cars that can be supported on a guideway designed to integrate well with existing streetscapes. Another feature of ICTS technology is its ability to incorporate other utilities into the guideway, producing the positive result of reducing street clutter caused by hydro poles and street lights.

Shadows from the guideway can be reduced by running the guideway down the median of major arterial roads which have adjacent residential land uses. Shade diagrams prepared for Metro Canada indicate that during summer months shadowing will be limited to roadways. In the spring, fall and winter, shadows will fall on front yards in some locations during the morning and evening hours.

The second issue to be considered is visual intrusion by the transit rider or the wayside property owner. Some homeowners have expressed concern about the loss of privacy in their front and back yards because of an elevated transit service. While this concern must be considered it must also be remembered that rapid transit trains pass quickly by any one point, that existing privacy in front yards is limited and that views of back yards from the transit vehicles would be blocked for the most part by existing buildings and vegetation. Any views into back yards would be of very short duration and comparable to existing views from cars and buses.

ENVIRONMENT

NATURAL ENVIRONMENT

The most prominent natural feature of the City of Hamilton and the Region of Hamilton-Wentworth is the Niagara Escarpment. The importance of the escarpment is established in the City and Regional Official Plans wherein, the escarpment is designated as an "Environmentally Sensitive Area". In recognition of this fact, Metro Canada has sought to minimize the physical impact of this project on the escarpment by tunnelling through it.

Other important natural environment issues under study are the impact of the project on mature trees, hydrology, air quality, climate, soils, vegetation and wildlife. These impacts are being analyzed on the four possible routes. Once a preferred route has been selected, detailed mitigative measures to reduce impacts on the natural environment will be recommended by the Environmental Consultant in the Environmental Assessment Report.

HUMAN ENVIRONMENT

In the Environmental Assessment Act, 1975, a broad definition is given to the word "environment". This definition includes the human environment. The human environment includes social, cultural and economic conditions that can influence the life of man and his community. In addition, this definition includes buildings, structures, or other devices made by man and any solid, liquid, gas, odour, heat, sound, vibration or radiation resulting from man's activity. It was with the human environment and response in mind that many of the design innovations of ICTS were developed. The rapid transit system has been designed to be quiet and to be aesthetically integrated with an active urban setting.

ENVIRONMENTAL ASSESSMENT

An environmental assessment is being prepared that will address the issues of natural and socio-economic impacts of this project. The environmental assessment document will be a synthesis of many of the rapid transit studies dealing with the rationale for the project, costs and benefits, route evaluation and selection, mitigative measures to reduce impacts and alternatives to the undertaking.

The Region will review the findings of the Environmental Assessment when completed, and if a decision is made to proceed with rapid transit, will forward the report to the Ministry of the Environment for review. The report will then go on display for public review before the Minister of the Environment makes a final decision on the project.

SAFETY & SECURITY

VANDALISM

Vandalism which occurs to public property usually depends on the residents of the community. Where the residents are respectful of property, little vandalism will result.

Steps that can be taken by a public agency to prevent vandalism include maximizing vandal-proof design and repairing acts of vandalism that do occur rapidly so that they do not attract further acts of vandalism.

DESIGN

Rapid transit systems can be designed to maximize security. Experienced architects and proven design techniques can be employed to improve safety and security in stations. The use of mirrors and well-positioned ticket kiosks will ensure that all areas of a station are under supervision. It is standard practice in rapid transit design to eliminate all features which might result in safety or security problems.

EMERGENCY RESPONSE

Rapid Transit vehicles are equipped with a variety of systems for calling for help should it be required in an emergency. These systems, which may include such methods as cameras, microphones and emergency press strips, are connected directly to the transit operations centre and to the police and fire departments.

PASSENGER SECURITY

In the event of an operational emergency on the transit system, pre-determined emergency procedures will be brought into action. Fire, police, and ambulance staffs will be trained in advance. Trains will be normally brought into the next station and passengers deboarded there. Procedures are also being developed to handle emergencies at any point along the guideway or tunnel.

FIRE PROTECTION

Materials used in modern transit systems are fire resistant and fire proof. These materials are chosen in consultation with fire officials. Fire officials contribute to the design of the system itself to ensure that the dangers of fire are minimized.

The Hamilton Fire Department is working with the study team to determine optimal distances of the elevated guideways from building walls and in determining the best places for emergency equipment near the guideway. This will ensure that fire protection of buildings adjacent to the rapid transit line is maintained.

APPENDIX

PRIME CONSULTANT AND SUB-CONSULTANTS

STUDY TEAM COMPOSITION

STUDY TEAM	PARTICIPANTS	RESPONSIBILITY
ENGINEERING	Cole-Sherman Consulting Engineers	Engineering Design - Cost Estimates
	The Trow Group	Talus Monitoring - Geotechnical Design
	ABAM Limited	Guideway Design
	Proctor & Redfern Limited	Utility Re-Design
	Trevor Garwood-Jones Architects	Station Design
	Jim Strasman Architects	Station Design, Models
	Metro Canada Limited	Liaison with Hamilton-Wentworth Region
		System Engineering
PLANNING	Marshall, Macklin, Monaghan/Hatch Associates	Land-use planning
		Transportation planning
	Barton Myers Associates	Urban Integration - Design Concepts
	Northway - Gestalt	Air Photography
	Metro Canada Limited	Planning Team Co-ordination
		Liaison with Hamilton-Wentworth Region
	Mohawk College Transportation Students	Origin and Destination Survey

metro canada

STUDY TEAM	PARTICIPANTS	RESPONSIBILITY
ENVIRONMENTAL	Marshall, Macklin, Monaghan/Hatch Associates	Natural Environment Inventory Environmental Assessment Preparation
	McMaster University Engineering Students	Ambient Noise Survey
	Wilson, Ihrig and Associates	Ambient Noise Survey
	Metro Canada Limited	Noise and Vibration Impact Assessment Environmental Team Co-ordination Liaison with Hamilton-Wentworth Region Liaison with Ministry of the Environment
PUBLIC PARTICI-PATION	Connor Development Services	Open Houses/Chair Citizens Advisory Committee Community Relations Questionnaire Analysis
	Metro Canada Limited	Community Relations/Media Relations Co-ordinate Public Participation Public Presentations Liaison with Hamilton-Wentworth Region Staffing Open Houses
	Regional Municipality of Hamilton-Wentworth	Press Releases Staffing Open Houses

STUDY TEAM	PARTICIPANTS	RESPONSIBILITY
EVALUATION	M.M. Dillon Limited	System Goals and Objectives Evaluation Criteria for Selecting Alignments Alignment Evaluation Co-ordination
	Metro Canada Limited	
OPERATIONS ADVISORY COMMITTEE	Mr. F. Cooke,	General Manager, Hamilton Street Railway
	Mr. M.M. Ross,	Project Co-ordinator, Hamilton-Wentworth Rapid Transit Project Office, Regional Municipality of Hamilton-Wentworth
	Mr. A.T.C. McNab,	Retired Deputy Minister, Ontario Ministry of Transportation and Communications and retired Chairman of Toronto Area Transit Operating Authority (GO Transit)
	Mr. W.H. Paterson,	Retired General Manager of Subway Construction Toronto Transit Commission
	Mr. G.L. Blain,	Phaneuf, Gravelle, Blain et Associes, Inc. Former Director Transportation Dept., Montreal Urban Community Transit Commission
	Mr. J.T. Harvey,	Retired General Manager of Operations, Toronto Transit Commission

STUDY TEAM	PARTICIPANTS	RESPONSIBILITY
OPERATIONS ADVISORY COMMITTEE	Mr. H.T. Ledsham,	Manager of Engineering, Hamilton-Wentworth Rapid Transit Project Office, Metro Canada Limited
	Mr. K.G. Knight,	Vice President, Transportation Projects Metro Canada Limited
	Mr. P.J. McCann,	Project Manager, Hamilton-Wentworth Rapid Transit Project Office, Metro Canada Limited
	Mr. A.R. Gray,	Deputy Project Manager, Hamilton-Wentworth Rapid Transit Project Office, Metro Canada Limited

POOR

QUALITY

ORIGINAL